WHAT IS CLAIMED IS:

1. A method of detecting in a sample a β-tubulin isotype modified at cysteine residue 239, the method comprising the steps of:

(a) providing a sample treated with a β-tubulin modifying agent;

(b) contacting the sample with an antibody that specifically binds to a β-tubulin isotype modified at cysteine residue 239; and

(c) determining whether the sample contains a modified β-tubulin isotype by detecting the antibody.

2. The method of claim 1, wherein the antibody is a monoclonal antibody.

3. The method of claim 2, wherein the antibody is selected from the group consisting of 1F6D8, 1B2C11, 3A1C11, 2C1H7, 3F2A4, 5F5C11, and 6D4D11.

4. The method of claim 1, further comprising the step of using a control antibody that recognizes both modified and unmodified β-tubulins.

5. The method of claim 4, wherein the control antibody is a monoclonal antibody selected from the group consisting of 3D12D1, 4B6G6, 5F1D4, 6H8E3, AND 6H10C7.

6. The method of claim 1, further comprising the step of using a control antibody that recognizes only unmodified β-tubulins.

7. The method of claim 6, wherein the control antibody is a monoclonal antibody selected from the group consisting of 3E10A3, 6A7F9, and 6E7G1.

8. The method of claim 1, wherein the step of determining whether the sample contains a modified β-tubulin isotype comprises detecting the antibody in an assay selected from the group consisting of an ELISA assay, a western blot, an immunohistochemical assay, an immunofluorescence assay, and a real time imaging assay.

9. The method of claim 1, wherein the step of determining whether the sample contains a modified β-tubulin isotype further comprises quantitating the amount of modified β-tubulin isotype in the sample.

10. The method of claim 1, wherein the antibody is bound to a solid substrate.

11. The method of claim 1, wherein the sample is selected from the group consisting of an *in vitro* tubulin polymerization reaction sample, a cultured cell, and a patient sample.

12. The method of claim 11, wherein the patient sample is a blood sample.

13. The method of claim 11, wherein the patient sample is from a cancer patient receiving pentafluorobenzenesulfonamide chemotherapy.

14. The method of claim 11, wherein the patient sample is from a cancer patient receiving 2-fluoro-1-methoxy-4-pentafluorophenylsulfonamidobenzene chemotherapy.

15. The method of claim 11, wherein the patient sample is from a human patient.

16. The method of claim 1, wherein the antibody is covalently linked to a detectable moiety.

17. The method of claim 16, wherein the antibody is covalently linked to a biotin moiety, an iodine moiety, or an enzyme moiety.

18. A monoclonal antibody that specifically binds to a β-tubulin isotype modified at cysteine residue 239, the antibody selected from the group consisting of 1F6D8, 1B2C11, 3A1C11, 2C1H7, 3F2A4, 5F5C11, and 6D4D11.

19. The monoclonal antibody of claim 18, wherein the antibody is covalently linked to a detectable moiety.

20. The monoclonal antibody of claim 19, wherein the antibody is covalently linked to a biotin moiety, an iodine moiety, or an enzyme moiety.

21. A method of monitoring the amount of modified β-tubulin isotype in a patient treated with an agent that modifies cysteine residue 239 in a β-tubulin isotype, the method comprising the steps of:

(a) providing a sample from the patient treated with the β-tubulin modifying agent;

(b) contacting the sample with an antibody that specifically binds to a modified β-tubulin isotype; and

(c) determining the amount of modified β-tubulin isotype in the patient sample by detecting the antibody and comparing the amount of antibody detected in the patient sample to a standard curve, thereby monitoring the amount of modified β-tubulin isotype in the patient.

22. The method of claim 21, further comprising the step of adjusting the dose of the β-tubulin modifying agent administered to the patient.

23. The method of claim 21, wherein the agent is a pentafluorobenzenesulfonamide.

24. The method of claim 21, wherein the agent is 2-fluoro-1-methoxy-4-pentafluorophenylsulfonamidobenzene.

25. The method of claim 21, wherein the sample is a blood sample.

26. The method of claim 21, wherein the antibody is a monoclonal antibody.

27. The method of claim 26, wherein the monoclonal antibody is selected from the group consisting of 1F6D8, 1B2C11, 3A1C11, 2C1H7, 3F2A4, 5F5C11, and 6D4D11.

28. The method of claim 21, wherein the antibody is covalently linked to a detectable moiety.

29. The method of claim 28, wherein the antibody is covalently linked to a biotin moiety, an iodine moiety, or an enzyme moiety.

30. The method of claim 21, wherein the antibody is bound to a solid substrate.

31. A method of isolating a β-tubulin isotype modified at cysteine residue 239, the method comprising the steps of:

(a) providing a sample treated with a β-tubulin modifying agent;

(b) contacting the sample with an antibody that specifically binds to a modified β-tubulin isotype; and

(c) isolating the modified β-tubulin isotype by isolating the antibody.

32. The method of claim 31, wherein the antibody is a monoclonal antibody.

33. The method of claim 32, wherein the monoclonal antibody is selected from the group consisting of 1F6D8, 1B2C11, 3A1C11, 2C1H7, 3F2A4, 5F5C11, and 6D4D11.

34. The method of claim 31, wherein the antibody is covalently linked to a biotin moiety, an iodine moiety, or an enzyme moiety.

35. The method of claim 33, wherein the antibody is covalently linked to a biotin moiety, an iodine moiety, or an enzyme moiety.

36. The method of claim 31, wherein the antibody is bound to a solid substrate.

37. A method of detecting an antibody that specifically binds to β-tubulin modified at cysteine residue 239, the method comprising the steps of:

(a) providing a sample;

(b) contacting the sample with a peptide that specifically binds to the antibody; and

(c) detecting the antibody.

38. The method of claim 37, wherein the peptide is ATMSGVTTCLRFPGQLNA, GTMECVTTCLRFPGQLNA, or KATMSGVTTCLRFPGQLNA.

39. The method of claim 37, wherein the step of detecting the antibody comprises an ELISA assay.

40. The method of claim 37, wherein the peptide is bound to a solid substrate.

41. A method of detecting in a sample a modified tubulin, the method comprising the steps of:

(a) providing a sample treated with a tubulin modifying agent;

(b) contacting the sample with an antibody that specifically binds to a modified tubulin isotype; and

(c) determining whether the sample contains a modified tubulin by detecting the antibody.

42. A method of monitoring the amount of modified tubulin in a patient treated with an agent that modifies tubulin, the method comprising the steps of:

(a) providing a sample from the patient treated with the tubulin modifying agent;

(b) contacting the sample with an antibody that specifically binds to a modified tubulin; and

(c) determining the amount of modified tubulin in the patient sample by detecting the antibody and comparing the amount of antibody detected in the patient sample to a standard curve, thereby monitoring the amount of modified tubulin in the patient.

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